Abundance and proportion of ichthyoplankton of the Northeast U.S. Shelf from surveys conducted during the MARMAP (1977-1987) and EcoMon (1999-2008) programs.

Website: https://www.bco-dmo.org/dataset/560448
Data Type: Cruise Results
Version: 1
Version Date: 2015-06-16

Project
» Northeast Fisheries Science Center Ichthyoplankton Collection (NEFSC Ichthyoplankton)

Program
» National Marine Fisheries Service / Northeast Fisheries Science Center (NMFS/NEFSC)

Contributors	Affiliation	Role
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Abstract
Abundance and proportion of ichthyoplankton of the Northeast U.S. Shelf. Ichthyoplankton data from several surveys conducted during the Marine Resources Monitoring, Assessment, and Prediction (MARMAP; 1977-1987) and Ecosystem Monitoring (EcoMon; 1999-2008) programs. The Northeast Fisheries Science Center (NEFSC) has conducted several ichthyoplankton collection programs on the NEUS Shelf over the past forty years including the Marine Resources Monitoring, Assessment, and Prediction program (MARMAP, 1977 - 1987) and Ecosystem Monitoring (EcoMon, 1999 - present) program (Richardson et al. 2010). Both MARMAP and EcoMon were designed as multi-species plankton surveys, and sampling effort covered the entire NEUS Shelf from Cape Hatteras, North Carolina, to Cape Sable, Nova Scotia (Figure 1, Sibunka and Silverman 1984, 1989; Richardson et al. 2010).

Table of Contents

- Coverage
- Dataset Description
  - Methods & Sampling
  - Data Processing Description
- Data Files
- Supplemental Files
- Related Publications
- Parameters
- Instruments
- Deployments
- Project Information
- Program Information

Coverage

Spatial Extent: **N**:44.26110273 **E**:-65.91371179 **S**:35.87810748 **W**:-75.69231598
Temporal Extent: 1977-01-01 - 2008-12-31

Dataset Description

Abundance and proportion of ichthyoplankton of the Northeast U.S. Shelf. Ichthyoplankton data from several surveys conducted during the Marine Resources Monitoring, Assessment, and Prediction (MARMAP; 1977-1987) and Ecosystem Monitoring (EcoMon; 1999-2008) programs.

The Northeast Fisheries Science Center (NEFSC) has conducted several ichthyoplankton collection programs on the NEUS Shelf over the past forty years including the Marine Resources Monitoring, Assessment, and Prediction program (MARMAP, 1977 - 1987) and Ecosystem Monitoring (EcoMon, 1999 - present) program (Richardson et al. 2010). Both MARMAP and EcoMon were designed as multi-species plankton surveys, and sampling effort covered the entire NEUS Shelf from Cape Hatteras, North Carolina, to Cape Sable, Nova Scotia (Figure 1, Sibunka and Silverman 1984, 1989; Richardson et al. 2010).

References:

Richardson DE, Hare JA, Overholtz WJ, Johnson DL. 2010. Development of long-term larval indices for Atlantic herring (Clupea harengus) on the northeast US continental shelf. Ices Journal of Marine Science. 67(4):617-27. doi:10.1093/icesjms/fsp276

Sibunka JD, Silverman MJ. 1984. MARMAP surveys of the continental shelf from Cape Hatteras, North Carolina to Cape Sable, Nova Scotia (1977-1983). Atlas No. 1. Summary of operations. US Department of Commerce, NOAA Technical Memo. NMFS-F/NEC-33:306 p.

Sibunka JD, Silverman MJ. 1989. MARMAP surveys of the continental shelf from Cape Hatteras, North Carolina to Cape Sable, Nova Scotia (1984-87). Atlas No. 3. Summary of operations. US Department of Commerce, NOAA Technical Memo. NEFC-F/NEC-68:197 p.

Methods & Sampling

MARMAP used mainly a fixed station design covering the sample area of each survey approximately evenly (Sibunka and Silverman 1984, 1989). EcoMon sampled the same spatial extent of the shelf as MARMAP, but used a random-stratified design based on the NEFSC bottom trawl survey design (Azarovitz 1981). The number of plankton strata (n = 47) is lower than the bottom trawl survey (n = 108) as the narrow inshore stratum and the offshore shelf-break stratum of the bottom trawl survey (Azarovitz 1981) are combined in the EcoMon plankton sampling design. The area encompassed by each stratum determined the number of samples in that stratum. The number of stations sampled during an EcoMon survey is approximately 30 % less than that of MARMAP. Samples were collected four to eight times per year (primarily: January-February, March-April, May-June, July-August, September-October, and November-December) for each program (Richardson et al. 2010).

The basic station protocols were very similar for MARMAP and EcoMon (Jossi and Marak 1983, Ejsymont and Sherman 2000). Samples were collected both day and night using a 61-cm bongo. Net tow speed was approximately 1.5 knots. Double oblique tows were a minimum of 5-mintues in duration, and fished from the surface to within 5-m of the seabed or to a maximum depth of 200-m. The volume filtered of all collections was measured with mechanical flowmeters mounted across the mouth of each net. Mesh size of the net differed between the programs, and was 505-µm during MARMAP and 333-µm during EcoMon. Samples were preserved in 5% formalin.

Processing of most samples was conducted at the Morski Instytut Rybacki in Szczecin, Poland; the remaining samples were processed at the NEFSC or the Atlantic Reference Center, St Andrews, Canada. Larvae were identified to the lowest possible taxon and enumerated for each sample. Plankton tows differ with respect to volume of water filtered and maximum tow depth. In order to make data values comparable, these values were normalized through the use of a standard haul factor: $h = z * 10 / v$, where z = maximum tow depth (in meters) and v = volume of water filtered (in meters cubed). Taxon abundance for each station was standardized to number under 10 • m-2 sea surface (Morse 1989).

References:

Azarovitz TR. 1981. A brief historical review of the Woods Hole Laboratory trawl survey time series. Canadian Special Publication of Fisheries and Aquatic Sciences. 58:62-7.

Ejsymont L, Sherman K. 2000. Poland and the United States' cooperation in fisheries ecology: a multidecadal retrospective. Bulletin Sea Fisheries Institute Gdynia. 3(3-10).

Jossi JW, Marak RR. 1983. MARMAP plankton survey manual. US Department of Commerce, NOAA Technical Memo. NMFS-F/NEC-21:258 p. URL: http://nefsc.noaa.gov/publications/tm/pdfs/tmfnec21.pdf

Morse W. 1989. Catchability, Growth, and Mortality of Larval Fishes. Fish Bul. 87(3):417-46.
URL: http://fishbull.noaa.gov/873/morse.pdf

Richardson DE, Hare JA, Overholtz WJ, Johnson DL. Development of long-term larval indices for Atlantic herring (Clupea harengus) on the northeast US continental shelf. 2010. Ices Journal of Marine Science. 67(4):617-27. doi:10.1093/icesjms/fsp276

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Data Processing Description

Relative proportion (rel_proportion) of larvae was calculated yearly for each of the 47 EcoMon strata for six bi-monthly seasons (1 = January-February, 2 = March-April, 3 = May-June, 4 = July-August, 5 = September-October, and 6 = November-December). The mean number of larvae per stratum (mean_abund) was estimated from all tows made in a stratum in a single bi-monthly season in each year. The absolute number of larvae in the stratum was estimated by multiplying the mean abundance of larvae within a stratum in the bi-monthly season and year by stratum area (m^2). Thus, there were six estimates of larval abundance for each stratum per year, one for each season. If no samples were collected in a stratum for a year and season a 'nd' was placed in the mean_abund and rel_proportion columns.

BCO-DMO Processing:
- Sorted data by taxa, year, season, strata.
- Replaced spaces with underscores in taxa names.
- Modified parameter names to conform with BCO-DMO naming conventions.
- Replaced 'NaN' with 'nd'.

[table of contents | back to top]

Data Files

File	
ichthyoplankton.csv	(Comma Separated Values (.csv), 16.64 MB) MD5:6aae6ca49f1def73fde09fc2e456f3c1
Primary data file for dataset ID 560448	

[table of contents | back to top]

Supplemental Files

File	
Azarovitz (1981) paper	
filename: Azarovitz1981.pdf	(Portable Document Format (.pdf), 910.60 KB) MD5:aabd40787953dfe7b57d01124ca8d915
Azarovitz (1981) paper	
Figure1 EcoMon Strata Map	
filename: Figure1_EcoMon_StrataMap.pdf	(Portable Document Format (.pdf), 267.41 KB) MD5:dbb7896d1f51d91f85460aca04ebaec9
Figure1 EcoMon Strata Map	

[table of contents | back to top]

Related Publications

Richardson, D. E., Hare, J. A., Overholtz, W. J., & Johnson, D. L. (2009). Development of long-term larval indices for Atlantic herring (Clupea harengus) on the northeast US continental shelf. ICES Journal of Marine Science, 67(4), 617–627. doi:10.1093/icesjms/fsp276
Methods

[table of contents | back to top]

Parameters

Parameter	Description	Units
taxa	Species/taxonomic name.	text
year	4 digit GMT year	dimensionless
season	1 digit code for bimonthly sample collection period: 1=January-February; 2=March-April; 3=May-June; 4=July-August; 5=September-October; 6=November-December.	dimensionless
strata	2 digit code for EcoMon plankton strata.	dimensionless
lat	Strata latitude center in decimal degrees	decimal degrees
lon	Strata longitude center in decimal degrees	decimal degrees
area	Strata area in square kilometers	square kilomters (km^2)
mean_abund	Strata mean abundance (mean number of larvae under 10 m^2 sea surface)	mean number of adults
rel_proportion	Strata relative proportion (% collected in a stratum for that season and year)	percentage (%)

[table of contents | back to top]

Instruments

Dataset-specific Instrument Name	
Generic Instrument Name	MARMAP Bongo Net
Generic Instrument Description	A non-opening-closing descendant of the McGowan/Brown Bongo net, consisting of a pair of circular hoops (61 cm in diameter and 30 cm long) joined by a central yoke which is clamped to the towing cable. The nets are 61 cm in diameter and have a cylindrical section 147 cm long and a conical section 153 cm long. Mesh sizes from 0.1 to 0.5 mm have been used, but normally 0.333 mm is used. A flowmeter is present in each hoop [Posgay and Marak (1980), Fig. 1].

[table of contents | back to top]

Deployments

NEFSC-Bottom_Trawl

Website	https://www.bco-dmo.org/deployment/637779
Platform	NOAA Ship Trawl-Survey-Vessel
Start Date	1963-09-01
End Date	2008-12-31
Description	This is a 'catch-all' deployment for 50 years of Fisheries surveys.

[table of contents | back to top]

Project Information

Northeast Fisheries Science Center Ichthyoplankton Collection (NEFSC Ichthyoplankton)

Coverage: Northeast U.S. Shelf Ecosystem from Cape Hatteras, North Carolina to Cape Sable, Nova Scotia

The Northeast Fisheries Science Center (NEFSC) has conducted several ichthyoplankton collection programs on the NEUS Shelf over the past forty years including the Marine Resources Monitoring, Assessment, and Prediction program (MARMAP, 1977 - 1987) and Ecosystem Monitoring (EcoMon, 1999 - present) program (Richardson et al. 2010). Both MARMAP and EcoMon were designed as multi-species plankton surveys, and sampling effort covered the entire NEUS Shelf from Cape Hatteras, North Carolina, to Cape Sable, Nova Scotia (Figure 1, Sibunka and Silverman 1984, 1989; Richardson et al. 2010).

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[table of contents | back to top]

Program Information

National Marine Fisheries Service / Northeast Fisheries Science Center (NMFS/NEFSC)

Website: http://www.nefsc.noaa.gov/history/nefsc.html

Coverage: U.S. Continental Shelf

The Northeast Fisheries Science Center is the research arm of NOAA Fisheries in the Northeast region. The Center plans, develops, and manages a multidisciplinary program of basic and applied research to: (1) better understand living marine resources of the Northeast Continental Shelf Ecosystem from the Gulf of Maine to Cape Hatteras, and the habitat quality essential for their existence and continued productivity; and (2) describe and provide to management, industry, and the public, options for the conservation and utilization of living marine resources, and for the restoration and maintenance of marine environmental quality.

The functions are carried out through the coordinated efforts of research facilities located in Massachusetts, Rhode Island, Connecticut, New Jersey, and Washington, DC.

NOAA's National Marine Fisheries Service is the federal agency, a division of the Department of Commerce, responsible for the stewardship of the nation's living marine resources and their habitat. NOAA's National Marine Fisheries Service is responsible for the management, conservation and protection of living marine resources within the United States' Exclusive Economic Zone (water three to 200 mile offshore). Using the tools provided by the Magnuson-Stevens Act, NOAA's National Marine Fisheries Service assesses and predicts the status of fish stocks, ensures compliance with fisheries regulations and works to reduce wasteful fishing practices. Under the Marine Mammal Protection Act and the Endangered Species Act, NOAA's National Marine Fisheries Service recovers protected marine species (i.e. whales, turtles) without unnecessarily impeding economic and recreational opportunities. With the help of the six regional offices and eight councils, NOAA's National Marine Fisheries Service is able to work with communities on fishery management issues. NOAA's National Marine Fisheries Service works to promote sustainable fisheries and to prevent lost economic potential associated with overfishing, declining species and degraded habitats. NOAA's National Marine Fisheries Service strives to balance competing public needs.

National Oceanic and Atmospheric Administation (NOAA) is an agency that enriches life through science. Our reach goes from the surface of the sun to the depths of the ocean floor as we work to keep citizens informed of the changing environment around them.

From daily weather forecasts, severe storm warnings and climate monitoring to fisheries management, coastal restoration and supporting marine commerce, NOAA's products and services support economic vitality and affect more than one-third of America's gross domestic product. NOAA's dedicated scientists use cutting-edge research and high-tech instrumentation to provide citizens, planners, emergency managers and other decision makers with reliable information they need when they need it.

NOAA's roots date back to 1807, when the Nation's first scientific agency, the Survey of the Coast, was established. Since then, NOAA has evolved to meet the needs of a changing country. NOAA maintains a presence in every state and has emerged as an international leader on scientific and environmental matters.

NOAA's mission touches the lives of every American and we are proud of our role in protecting life and property and conserving and protecting natural resources.

[table of contents | back to top]